There's enough food for everyone, but the poor can't afford to buy it

Sir — The existence of malnourished and hungry people has been used repeatedly in this journal and elsewhere as a justification for biotechnology and for the production of more food[1,2]. This assumption supports a main policy plank of the Rockefeller Foundation food biotechnology programme[2] and other major international and charitable institutions.

Yet there are good reasons to be sceptical of the equation "more food equals less hunger".

The world produces more than enough food at present to feed everyone, but nevertheless many people still starve or are malnourished[1–3]. As economist and Nobel laureate Amartya Sen has pointed out, it is poverty, not a physical shortage of food, that is the primary cause of hunger in the modern world[4].

The political and economic reasons don't change: the amount of food that Ireland, for example, exported to Britain during the potato famine of 1845–46 would have been sufficient to feed those who starved. The root cause of the 1974 Bangladesh famine was a flood that displaced people from their jobs; more food was produced that year in Bangladesh than in surrounding years, yet — unable to earn money to buy it — up to 1.5 million people starved to death[4].

Partial solutions such as local production of food, as suggested by Conway and Toenniessen[2], cannot circumvent economic reality. Even the World Bank has concluded that the problem of hunger can only be solved by "redistributing purchasing power" to the hungry[5].

What about the state of food supplies in, say, 2040, when it is predicted that there will be ten billion people compared with today's six billion? In absolute terms, the world already produces enough food to feed ten billion people — it's just that most of it is fed to animals (this accounts for 80% of all arable crops in the United States, a figure close to the world average[6]). If the area of arable land devoted to crops for human consumption were doubled to 40%, this need not drastically affect supplies of meat or dairy produce, since farm animals also eat other, non-crop foods such as grass in the summer, silage and hay in the winter.

Clearly, what is missing is the "purchasing power" of the poor.

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1. Trewavas, A. *Nature* **402**, 231–232 (1999).
2. Conway, G. & Toenniessen, G. *Nature* **402,** Supplement C55–C58 (1999).
3. Simms, A. *Selling Suicide: Farming, False Promises and Genetic Engineering in Developing Countries* (Christian Aid, London, 1999).
4. Sen, A. K. *Poverty and Famines: An Essay on Entitlement and Deprivation* (Oxford Univ. Press, Oxford, 1983).
5. World Bank. *Food Security for the World* (statement prepared for the World Food Summit, 1996).
6. *Agriculture Statistical Yearbook* (Eurostat, Luxembourg, 1996).

Spanish university study ignores research

Sir — As Xavier Bosch reports (*Nature* **402,** 848; 1999), the recently publicized ranking of Spanish universities by quality may not be the first such list, but it has had by far the most impact on Spain's mass media. The repercussions are likely to encourage the growth of an evaluation culture in Spanish universities, which is positive. However, I believe the importance of this study has been exaggerated and people have made judgements without evaluating the 71 indicators used by the authors.

I do not see what factors such as "age of the university" or "percentage of women among first-year students" can reveal about the quality of an institution (even though they favoured my university: it is 505 years old and more than two-thirds of its students are women). I did not find any indicator of research quality and there was no evaluation of scientific papers published in leading journals. Nor were patents, contracts or research projects considered.

Given that a university carries out both teaching and research, I estimate that this study has done only half the work.

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Not too late to apologize

Sir — The editorial "Hollow apologies should be avoided" (*Nature* **403,** 813; 2000) gives a correct account of the efforts of the Max Planck Society (MPS) to explore the history of its predecessor, the Kaiser Wilhelm Society, during the Nazi period. It discusses MPS president Hubert Markl's statement that it is not within the moral authority of those who did not take part in Nazi experiments to apologize on behalf of those who committed these crimes. It suggests apologies may be due, rather, for the MPS's ignoring of the issue until quite recently.

The MPS can agree with this. However, President Markl has already publicly apologized. In 1998, at a ceremony for the fiftieth anniversary of the society's foundation, he said: "I consider it my duty to offer a public apology for that which the Max Planck Society may have failed to do in the face of its responsibility for the consequences of its prehistory during the Third Reich — even were it only that the Society has done too little to explore this prehistory for too long." In the same speech, Markl condemned the actions of German scientists against Jewish and other victims of the terrible Nazi past in more detail. The full text is on the Internet (http://www.mpg.de/jubilae_e.htm).

The question of public statements to survivors can only be decided after the independent commission of historians has given its advice to the president. But the Max Planck Society is grateful for this chance to let your readers know that it has acted — though maybe regrettably late — exactly as advised in your editorial.

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DoE still involved in the Human Genome Project

Sir — I would like to correct the erroneous impression given by the News article "US energy agency pulls plug on role in genome project" (*Nature* **404,** 4; 2000). The Department of Energy (DoE) is not pulling the plug on its role in this important project. As part of the international human genome project, DoE is responsible for determining the DNA sequence of human chromosomes 5, 16 and 19.

DoE's commitment to completing this project has not changed: we will deliver, as promised, a working draft sequence of these three chromosomes in 2000 and their complete, high-quality sequence by 2003. We will continue to coordinate our human DNA sequencing efforts with our partners: the National Human Genome Research Institute at the National Institutes of Health and the Wellcome Trust in the UK.

Obtaining a complete, high-quality sequence of human DNA is only one of the goals of the Human Genome Project. The DoE biological and environmental research advisory committee (BERAC) has been asked to identify the next most important contributions it can make in other goals and is already investing in the development of the tools needed to exploit fully the value of knowing the complete DNA sequence of the human and other organisms.

DoE will continue its sequencing efforts in model organisms, including the mouse and various microbes, whose DNA sequence information contributes to DoE missions in bioremediation and carbon sequestration.

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